

Water Supply

PROGRAM DESCRIPTION

Residents of Fairfax County receive public water service from one of three water agencies: Fairfax Water (d.b.a. name of the Fairfax County Water Authority), City of Fairfax Department of Transit and Utilities, and the Falls Church Department of Public Utilities. The Towns of Vienna and Herndon, while operating their own water distribution systems, purchase water from the City of Falls Church and Fairfax Water, respectively. In terms of meeting water supply needs, the towns are dependent on these two water agencies. Using recent estimated averages, Fairfax Water serves 79 percent of Fairfax County residents, Falls Church serves 13 percent, the City of Fairfax one percent and the remaining 7 percent of the residents receive water from their own individual wells.

LINK TO THE COMPREHENSIVE PLAN

Fairfax County's Comprehensive Plan has established a number of objectives and policies in order to:

- ✓ Provide the facilities to treat, transmit, and distribute a safe and adequate potable water supply.
- ✓ Identify the need for additional water transmission facilities, including the Corbalis-Fox Mill Water Main, Fox Mill-Vale Road Water Main, Waples Mill – Vale Road Water Main and the Stringfellow Road Water Main.

Source: 2003 Edition of the Fairfax County Comprehensive Plan, as amended

CURRENT PROGRAM INITIATIVES

While Fairfax County has neither direct administrative nor budgetary control over water suppliers, the importance of water facilities to County planning is recognized. The Board of Supervisors has entered into an agreement with Fairfax Water which requires Board approval of all capital projects undertaken by Fairfax Water. Fairfax Water projects included in this CIP represent a program guided by the objectives of the Comprehensive Plan and endorsed by the Board of Supervisors. In the interest of providing a broader picture to the citizens of Fairfax County, the independent program for Falls Church is also presented. Inclusion in this document represents neither concurrence nor approval by Fairfax County of the individual projects proposed by Falls Church. It is presented for information purposes only. Additional information can be found in Fairfax Water's 2005 ten year Capital Improvement Program, which is available directly from Fairfax Water.

Fairfax Water

The principal sources of water for Fairfax Water are the Occoquan River and the Potomac River. Supplementary sources of water include one public well system and interconnections with the Cities of Fairfax and Falls Church, Town of Vienna, Loudoun County, and Arlington County. The Occoquan Reservoir is impounded by a gravity-type concrete dam across the Occoquan River, a few miles upstream of its confluence with the Potomac River. The dam was constructed in 1957. The drainage area of the Occoquan River above the dam is approximately 595 square miles. The dam impounds about 8.3 billion

gallons of water when filled to the crest of the dam at Elevation 122 feet, mean sea level. The present Occoquan River supply has a safe yield of about 72 million gallons per day (MGD).

Treatment of water from the Occoquan Reservoir is provided by the 120 MGD Griffith Water Treatment Plant in Lorton, to be placed in service in 2005. This facility applies various chemicals for coagulation, the control of taste and odors, fluoridation, and disinfection. Construction of the Griffith Treatment Plant began during 2000. The Griffith Treatment Plant replaces the Lorton and Occoquan Treatment Plants.

Construction of the intake structure, raw water pumping station and initial phase of the Corbalis Treatment Plant commenced in 1978 and was placed into operation in 1982. A major plant expansion was begun in 1992 and completed in 1995. The Corbalis Treatment Plant is authorized by the Virginia Department of Health to operate at a filtration rate of 150 MGD. Facilities are available for applying various chemicals for coagulation, control of taste and odors, fluoridation, and disinfection. Construction of the next increment of capacity began in 2005. When completed, this will increase the capacity of the Corbalis plant to 225 MGD.

Twenty-nine booster pumping stations are located within the distribution system to provide adequate pressure throughout Fairfax Water's service area. A total of 42 million gallons (MG) of distribution system storage is provided at 31 locations throughout Fairfax County. There are approximately 3,150 miles of water main up to 54 inches in diameter in the system. The distribution system is interconnected at 76 locations with 12 other water systems in northern Virginia.

Development of Fairfax Water's supply, treatment, transmission, and distribution facilities is conducted in accordance with a ten year Capital Improvement Program. Highlights of the current program include:

- **Construction of the new F. P. Griffith Water Treatment Plant:** When completed in 2005, this facility will utilize state-of-the-art treatment techniques capable of meeting the newly adopted water quality requirements of the Safe Drinking Water Act.
- **Capacity Development at the Corbalis Water Treatment Plant:** Construction of the next 75 MGD increment of the Corbalis Plant is underway to provide additional production capacity needed to satisfy projected demand for water within Fairfax Water's service area.
- **Creation of a Consolidated Laboratory:** A new laboratory for the analysis of all source and finished water is nearing completion at Corbalis. Laboratory improvements are necessary to achieve water quality objectives and demonstrate compliance with drinking water regulations.
- **Construction of various Transmission Mains:** Transmission mains include: Corbalis to Fox Mill Water Main (Phase II), Stringfellow Road Water Main, Fox Mill to Vale Road Water Main, and Waples Mill to Vale Road Water Main.
- **System Reliability Improvements:** Construction of back-up power generation facilities and additional system storage to mitigate plant and pumping station failures due to interruptions in commercially supplied power.
- **Implementation of a Supervisory Control and Data Acquisition (SCADA) system:** By providing remote monitoring and control capability, SCADA will promote more efficient system performance during both routine and alternative operations.
- **Watershed Management Activities:** Fairfax Water continues to advocate watershed protection through the following projects and programs: Support of the Occoquan Watershed Monitoring Program and the Occoquan Nonpoint Source Program, Study of critical watershed areas, increased involvement in watershed and water quality issues, and analysis of ongoing activities in the watershed.

Falls Church Department of Public Utilities

Falls Church buys treated water from the U.S. Corps of Engineers via a 36-inch connection to the Dalecarlia Filter Plant located on MacArthur Boulevard in the District of Columbia. The Corps obtains its raw water from the Potomac River at Great Falls. The Falls Church Water System has a current system capacity of 45 MGD. The Falls Church Water System consists of the main pumping station at Chain Bridge and seven booster pumping stations. The system includes 10 storage facilities with a total capacity of approximately 14.2 MGD. The Tysons Tank has been demolished and a new tank with a capacity of 2.2 MG was constructed in 2003. The overall system consists of approximately 485 miles of pipe ranging from 4 inches to 42 inches.

CURRENT PROJECT DESCRIPTIONS

FAIRFAX WATER


1. **General and Administrative.** \$84,680,000 for annual expenses associated with administration and overhead. These expenses include materials and supplies; refund of advances; and costs associated with net revenue funded projects, but not attributed to a single project or program.
2. **Subdivision and Other Development Projects.** \$9,360,000 for annual expenses associated with the review and approval of plans for water main installation associated with land development activities. This project also includes provisions for FCWA inspection of water mains installed by land development contractors.
3. **Extraordinary Maintenance and Repairs.** \$86,028,000 for extraordinary maintenance and major repair of supply, treatment, transmission, distribution and general plant facilities associated with a specific project.
4. **Additions, Extensions, and Betterments.** \$91,285,000 for improvement and betterment of existing supply, treatment, transmission, distribution and general plant facilities associated with a specific project.
5. **General Studies and Programs.** \$20,036,000 for general studies, programs, engineering and research pertaining to water quality, water supply, and system development.
6. **Treatment Facilities.** \$201,056,000 for the future 120 MGD Griffith Water Treatment Plant on the Occoquan Reservoir. Costs also include the construction of a consolidated water analysis laboratory at the Potomac Treatment facilities.
7. **Transmission Facilities.** \$18,450,000 for the design and construction of a transmission SCADA system and various pumping station modifications throughout Fairfax County.
8. **General Plant Facilities.** \$5,210,000 for annual expenses attributed to administration, overhead, and bond financing for projects funded by current bond issue, future bond issue, or funds on hand.
9. **Potomac Stage III Treatment Facilities.** \$192,100,000 for the design and construction of the next production capacity increment at the Corbalis Water Treatment Plant.
10. **Potomac Stage III Transmission Facilities.** \$57,598,000 for the design and construction of various transmission facilities primarily associated with development of the Potomac River Water Supply Facilities. Water main projects include the Corbalis-Fox Mill Water Main, Fox Mill-Vale Road Water Main, Waples Mill-Vale Road Water Main, and the Stringfellow Road Water Main.
11. **Potomac Stage III General Plant Facilities.** \$35,390,000 for annual expense attributed to administration, overhead, and bond financing associated with development of the Potomac River Water Supply Facilities funded by future bond issue and funds on hand.

FALLS CHURCH DEPARTMENT OF PUBLIC UTILITIES

12. **Water Main Replacement (Route 50 Water Main).** \$5,400,000 to implement additional redundancy and security for the City's water system with a proposed water main extending from the Capital Beltway to Seven Corners. An emergency source of water may be available from Fairfax Water that can serve the City and surrounding area in an emergency. An engineering study intended to validate this concept is being undertaken in FY 05. Funds allocated for FY 06 are for design.
13. **Seven Corners System Improvements.** \$2,600,000 for water main improvements and a possible new storage tank to address low pressure and fire protection issues in the Seven Corners area.
14. **Water Main Replacement Program.** \$5,000,000 over five years as part of a systematic approach to water main replacement throughout the City's water system, which is based on several factors, including main break history, impact to customers, and traffic impacts. Each year this list is reevaluated and priority replacement projects are selected for construction.
15. **Property Yard Relocation.** \$3,700,000 to relocate the City's Property Yard facilities.
16. **SCADA and Telemetry System Upgrades.** \$900,000 to upgrade the existing, obsolete SCADA and Telemetry equipment. This equipment allows the Chain Bridge Pumping Station operators to monitor water storage tank levels and to turn pumps on and off at pumping stations throughout the water distribution system.
17. **Water Utility Security.** \$1,250,000 for upgrades to the physical and electronic security systems of the water system facilities.
18. **Arlington Special Pumping Station.** \$75,000 for improvements to an existing Arlington County Pumping Station that serves a small area in the Falls Church system.
19. **Meter Replacement Project.** \$3,000,000 to replace aging water meters with meters that can be read from a laptop computer while driving through a neighborhood.
20. **Washington Aqueduct Residuals Disposal.** \$6,200,000 as the City's share of a project to eliminate discharge of water treatment residuals to the Potomac River.

PROJECT COST SUMMARIES
WATER SUPPLY
(\$000's)

			FY 2006	FY 2007	FY 2008	FY 2009	FY 2010			
Project Title/ Project Number	Source of Funds	Anticipated to be Expended Thru FY 2005						Total FY2006-FY2010	Total FY2011-FY2015	Total Project Estimate
Fairfax County Construction										
1. General and Administrative	SR	C	4,050	4,550	5,290	11,660	12,730	38,280	46,400	84,680
2. Subdivision and Other Development Projects	SR	C	960	980	1,000	1,020	1,040	5,000	4,360	9,360
3. Extraordinary Maintenance and Repairs	SR	C	10,276	9,573	8,920	8,708	9,123	46,600	39,428	86,028
4. Additions, Extensions, and Betterments	SR	C	25,806	24,256	12,075	4,793	4,863	71,793	19,492	91,285
5. General Studies and Programs	SR	C	2,106	3,593	6,754	1,150	1,193	14,796	5,240	20,036
6. Treatment Facilities	SR	188,151	8,250	3,730	925			12,905		201,056
7. Transmission Facilities	SR	9,157	3,771	1,762	1,760	1,400	600	9,293		18,450
8. General Plant Facilities	SR	1,410	1,200	630	480	1,030	460	3,800		5,210
9. Potomac Stage III Treatment Facilities	SR	62,100	50,000	50,000	30,000			130,000		192,100
10. Potomac Stage III Transmission Facilities	SR	23,580	9,500	6,518				16,018	18,000	57,598
11. Potomac Stage III General Plant Facilities	SR	5,160	5,940	6,500	6,430			18,870	11,360	35,390
Subtotal		289,558	121,859	112,092	73,634	29,761	30,009	367,355	144,280	801,193
Falls Church Department of Public Utilities										
12. Water Main Replacement (Route 50 Water Main)	SR		400	2,500	2,500			5,400		5,400
13. Seven Corners System Improvements	SR	300	800		1,500			2,300		2,600
14. Water Main Replacement Program	SR		1,000		1,000	1,000	2,000	5,000		5,000
15. Property Yard Relocation	SR			2,050		1,650		3,700		3,700
16. SCADA and Telemetry System Upgrades	SR	200	200	500				700		900
17. Water Utility Security	SR	550	375	325				700		1,250
18. Arlington Special Pumping Station	SR		75					75		75
19. Meter Replacement Project	SR		1,500	750	750			3,000		3,000
20. Washington Aqueduct Residuals Disposal	SR		250	1,750	2,350	1,700	150	6,200		6,200
Subtotal		1,050	4,600	7,875	8,100	4,350	2,150	27,075	0	28,125
GRAND TOTAL		\$290,608	\$126,459	\$119,967	\$81,734	\$34,111	\$32,159	\$394,430	\$144,280	\$829,318

Key: Stage of Development	
	Feasibility Study or Design
	Land Acquisition
	Construction

Notes:	
Numbers in bold italics represent funded amounts.	
A "C" in the Authorized or Expended Column denotes a continuing project.	

Key: Source of Funds	
B	Bonds
G	General Fund
X	Other
U	Undetermined
SR	Systems Revenues
RB	Revenue Bonds